

described leaf tips? It stands to reason that they take part in the water regime of the plant. The leaf tip is an organ established to maximize water vapour or discharge (Lang 1901).

According to my hypothesis, the leaf tip supports transpiration so that above all the growing meristem is substantially fed. Gardeners leave a so-called "shoot of drought" in grafted trees for the same purpose (fig. 5). This is a logical explanation, but an experimental proof is required.

## Literature

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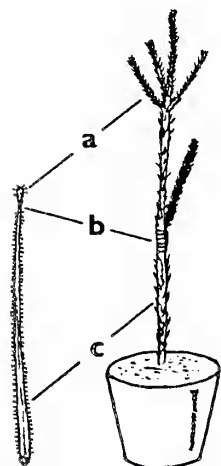


Fig. 5.- Analogy between functions of the leaf tip in *Byblis gigantea* and the "shoot of drought" in a grafted fir tree. a - water expelling apices, b - areas of actively growing tissue, c - mature basal parts. Both apices support transport of nutrient solution to growing tissues by means of expelling water by transpiration.

# THE LIMONIUM PEREGRINUM OF CAROLUS CLUSIUS

Martin Cheek and Malcolm Young  
Herbarium, Royal Botanic Gardens, Kew,  
Richmond, Surrey, TW9 3AE, U.K.

5 Normington Close,  
Leigham Court Road,  
London SW16 2QS, U.K.

The history of the introduction of *Sarracenia* from North America to Europe has been examined by J.D. Hooker (1874: 484; 1875: 6) who is followed by Lloyd (1942: 18), Slack (1979:26,46) and Juniper *et al.* (1989: 14). All are agreed that the first description and plate to be published were by Clusius (as *Limonium peregrinum*/congener, 1601:lxxxij), apart from the illustration of *S. minor* Walt. by L'Obel in his *Nova Stirpium Adversaria* (1576). Slack (1979:49) and Cheek (1994) show that the work of Clusius concerns the northern subspecies of the most widespread species, that is, *Sarracenia purpurea* L. subsp. *purpurea*, as was first pointed out by Wherry (1933: 5).

In order to conserve existing usage of nomenclature for the subspecies of *S. purpurea* (Cheek, 1994; Cheek *et al.*, in press), the plate of Clusius has been proposed as the new nomenclatural type of the species, and incidentally that of the genus *Sarracenia* L. and the family Sarraceniaceae.

Since the plate and text of Clusius are thus not without interest, and since it has not been possible to trace any reproduction or translation of this text or plate other than the original, they are presented below, together with some biographical notes on Clusius. For the sake of exactness, our translation is as literal as possible. This has resulted in some quaint sentences but should give the reader a flavour of the original. The plate around which the original text was arranged is reproduced in Fig. 1.

"This plant is very exotic and elegant, whose picture and dried leaf, from Paris was sent all the way to me by that humane fellow and most diligent pharmacist Claude Gonier, who had received it dried, and mutilated with a broken stem, from Lisbon, just as he was writing to me.

This plant, Claude says, has in fact nine, ten or more leaves sprouting from the top of the head of the root. Their shape is different from the leaves of all the plants that I have ever seen, because they are hollow, like the flowers of *Aristolochia*, with a swollen belly as if endowed with a dewlap, the back bulging, with its lowest part narrow and gradually increasing into a wide area, with the topmost part wider still and open, and as if shaped into a semi-circle. All the leaf is hard and as if resembling skin; the uppermost part of the leaf is open, internally distinct [distincta - perhaps 'separated?'] with many thick veins from dark purple [to other colours?]. Between the leaves the lower part of the broken stem projected, as the picture showed. The root is not markedly big and is divided into a number of branches. What kind of flowers, or what kind of seed it brings forth, has not been written down, its countries of origin have not been indicated, neither has it been noted at what time it produces flowers.

Moreover, to what class of plants I should refer this plant I cannot say. Of the leaves however, the thickness or (if it is permitted to say so) the fleshiness, and other well known characteristics virtually compel me to conclude it should be compared to some genus of the *Limonium* of Matthioli. And it will be possible (in my opinion) to be named for the meantime, *Limonium peregrinum* until it finds another name more appropriate, from a more careful observation of the entire plant.

But in order that it should not fail to have a place in our Observations of Plants, we have postponed its history to the back [lit. heel] of volume four."

Clusius begins with a note on the origin and nature of the material he had to hand, then goes on to describe it with great verve, concluding with the lamentable absence of flower or fruit which disables him from drawing any conclusions on its taxonomic affinities. Clutching at straws, he speculates that maybe it is congeneric (hence '*Limonium congener*') with the *Limonium* of Mattioli, on account of the thickened leaves. Clusius gives it the name *Limonium peregrinum*, the foreign *Limonium*. Previously (Juniper *et al.* 1989)

Mattioli was an Italian botanist and physician who was about 20 years senior to Clusius. His *Limonium* (Mattioli 1560: 496) is the same as ours today, based on *Limonium* Mill., that is the Sea Lavender: quite unrelated to *Sarracenia*. Clusius however, goes out of his way to qualify his opinion saying that this name is provisional until complete material is available which will allow a more appropriate name to be bestowed upon the plant. Most recent authors have not appreciated this: ..'It seems curious today that he should have classified it as one of the totally dissimilar Sea Lavenders'(Slack, 1979: 46).

Carolus Clusius is the Latinized form of Charles de L'Escluse, also known as l'Escluse. He was born in Arras (now in France, then unaligned) on 19 February 1526, and died in Leiden, Netherlands, in

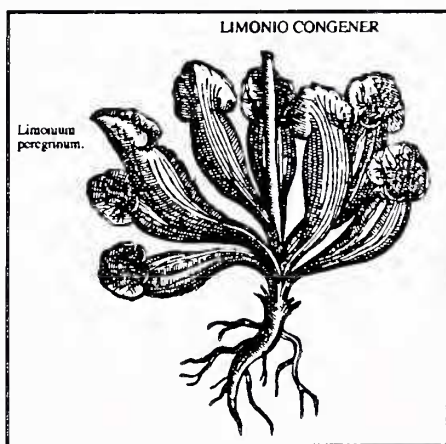


Fig. 1. A copy of the original plate in the *Rariorum Plantarum Historiam* of Clusius (1601).

1609. A survey of his life amounting to one and a half pages appears in the Dictionary of Scientific Biography (Gillespie, 1973, 8: 120-121) from which the information here is largely taken. Some additional information published since appears in Aumüller (1973), but the most detailed account, amounting to 445 pages, is by Hunger (1927), in Dutch.

As the elder son of a rich and respected family, Clusius was well educated. He trained as a lawyer and became interested in botany in 1551 when he collected plants for his teacher, a Professor at Montpellier. His earliest works are translations and expansions of Latin texts into French, but also from other languages into French and Latin, usually biological works, largely botanical. His first original botanical work was an account of the plants of Spain based on his travels there and he repeated this success with an account of Hungarian plants. In 1593 he was appointed to the Chair of Botany at the University of Leiden until his death in 1609, by which time that place had become the botanical centre for the whole of Europe. Clusius had many correspondents apart from Claude Gonier from whom he derived plants and information. The *Rariorum Plantarum Historiam* included many other foreign plant species besides *Sarracenia* including the potato of which he gave an early description and propagated as early as 1588. Clusius was amongst the pioneer botanists who broke away from merely copying the text and plates of the ancient Greeks and Romans, as if they were sacrosanct. As his description shows, he was an acute observer above all else. He didn't confine himself to botany. He has been characterized as "one of the first outstanding figures in early Mycology" (Aumüller, 1973b). The most well-traveled botanist of his time, he recorded and translated Roman inscriptions wherever he roamed, and the quality of this work has been praised unanimously in later centuries. His fluency in both written and spoken Latin is mentioned in biographical works. The text that we have translated gives evidence of his skill in this direction.

Where did the specimen and plate come from? Stafleu and Cowan (1976: 513) note that "herbarium specimens documenting Clusius" descriptions are extremely rare. The Bauhins (BAS) received Clusius' material and so did Platter (BE) but in the absence of annotations the specimens are difficult to locate." So the prospect of finding clues from the specimen is not enticing. We have investigated two works on his correspondence, that of Conti (1939) and Roze (1899), but neither mention anything about his correspondent Claude Gonier, who sent the material to him. So we have lost the opportunity of pursuing the correspondence with Gonier to see if by a remote chance he later did trace the origin of the *Sarracenia* specimen. We are left with the information given in the text and plate, and our knowledge that these represent a specimen of the northern subspecies of *S. purpurea* which occurs from New Jersey to Nova Scotia and Newfoundland, and that to have been in Clusius' hands by this circuitous route in time for analysis and publication in 1601, the material must have been collected some years previously, quite possibly within a century of Columbus' discovery of the New World in 1492. European activity in the Americas was then concentrated on Central America and the Caribbean, not sites for our plant. Cabot, from Bristol, reached Canada *en route* for the Northwest Passage in 1497 and may have had the opportunity to collect, though I have found no record. If he did so it is strange that none of his collections came to light earlier. He seems an unlikely source. The *Mayflower* and the Pilgrim fathers who heralded the main wave of settlement had yet to reach North America and though Sir Walter Raleigh founded the ill-fated colony of Roanoke in 1585, this was in Virginia, where only the southern subspecies grows: not the subject of Clusius' plate. Further north, in the range of our plant, colonization in New Jersey began with Henry Hudson in 1609 (too late). The first permanent settlement north of Florida was made by the French under Chauvin in Nova Scotia in 1605 (too late for any specimen to reach Clusius for 1601). The most likely source of our

plant was someone who accompanied Cartier's repeated visits to what is now Quebec between 1534 and 1541 (Rousseau, 1956: 150). The colony was abandoned, apart from two visits, until the early 1600's. It is known that live plant material, such as *Thuja occidentalis* was introduced to Europe as a result of this visit, so why not a dried specimen of *Sarracenia*? The interval of 60 years is not easy to explain, but unsorted specimens can wait for this duration to come to light even in this century. Even more difficult to explain is the port of entry into Europe, Lisbon. The Portuguese are famous explorers, but were not famous for their exploration of North America and certainly not for bringing plant specimens from there. Will we ever discover by whom, when and where was Clusius' *Limonium peregrinum* collected?

## Acknowledgments

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